Catalogue of American Amphibians and Reptiles.

AXTELL, RALPH W. 1983. *Holbrookia propinqua.*

Holbrookia propinqua Baird and Girard Keeled earless lizard

Holbrookia propinqua Baird and Girard, 1852:126. Type-locality, "between Indianola and San Antonio (Texas)," restricted by Axtell (1981) to within a 12 km circle centered at 29°16'20"N-98°09'50"W, Wilson County, Texas. Lectotype, adult male, United States Nat. Mus. 2671A (chosen by Axtell, 1958), collected between 25 April and 5 May, 1851, by John H. Clark. Syntypes examined by author.

Holbrookia maculata propinqua: Cope, 1875:47.

• CONTENT. Two subspecies are recognized: *H. p. propinqua* and *H. propinqua piperata.*

• DEFINITION AND DIAGNOSIS. A medium-sized, slender *Holbrookia* of the *maculata* species group (*sensu* Axtell, 1958). Average and maximum snout-vent lengths for mature males are 49.8 and 60.0 mm; for females 48.1 and 56.0 mm. The tail is slightly flattened dorsoventrally, and averages 1.35 and 1.08 times SVL in adult males and females, respectively. The head is slightly elongated and depressed, with keeled, angled (ca. 9° from horizontal) supralabials. The enlarged dorsal head scales are smooth, slightly convex, and unsculptured. There are one to three rows of minute circumorbitals between the enlarged frontals and the supraoculars. The keeled dorsal scales are tiny, 146-177 from the interparietal to the posterior edge of the hindlimb, and 25-52 in one snout-interparietal length (counted posteriorly from the anterior edge of the forelimb). Femoral pores vary from 14 to 41 ($\bar{x} = 29.9 \pm 0.18$).

The dorsal pattern consists of four rows of brownish blotches on a pale grayish-tan ground. This blotching may be obliterated (especially in coastal populations) by white speckling in mature males and general bleaching in females. The paravertebral rows of larger blotches converge on the tail to form narrow, distally pointing, sharp-tipped V's. A pale zone separating the paravertebral and dorsolateral blotch rows extends from behind the eye to the tail. White scales along the anterior part of this zone usually appear as distinct light lateral nuchal stripes. The lateral-abdominal dark bars are black and elongate (3-4 times longer than broad) in adult males, grayish and less attenuate in females and young. There may be a faint trace of bluish-gray pigment around the bars in males. The gular region is either completely suffused or obscurely barred with fine melanic stippling. The remaining ventral side is unmarked opaque white. During the reproductive season, the sides of the head, neck, trunk, proximal limb joints and the underside of the tail become creamy, yellow, or even reddish in mature males. In ovigerous females hormonally sensitive areas become yellow to bright vermillion, or both.

• DESCRIPTIONS. Baird and Girard (1852), Cope (1880, 1900), and Schmidt (1922) described diagnostic characters. Data on variation are in Harper (1932), Smith (1946), Smith and Burger (1950), and Axtell and Wasserman (1953).

• ILLUSTRATIONS. Line drawings of scalation appeared in Cope (1900). Black and white photographs were published by Schmidt (1922) and Smith (1946). Color illustrations are in Conant (1975, both sexes), and Behler and King (1979).

• DISTRIBUTION. *Holbrookia propinqua* is limited to areas of sandy substrate along the Gulf of Mexico coast from Matagorda Island, Texas, southward on coastal dunes and barrier islands to near Punta del Morro and Punta Delgada, Veracruz, Mexico. Populations occur inland in extreme southern Texas (Webb and Duval counties southward), and on deep sandy soils in an arc along the southern edge of the Edwards Plateau, in Guadalupe, Gonzales, Wilson, Bexar, and Atascosa counties. A record from Maverick Co., Texas (Karges, 1979) is erroneous (Chaney, pers. comm.). Elevational range is from 0 to ca. 24 m.

• FOSSIL RECORD. Yatkola (1976) reported that *Holbrookia* (?) *antiqua* from middle Miocene deposits in western Nebraska resembles *H. propinqua* in size, tooth count, and morphology.

• PERTINENT LITERATURE. Literature on *H. propinqua* in Texas was indexed by Raun and Gehlbach (1972), and for Mexico by Smith and Smith (1976). Anatomical studies are by Earle (1961, inner ear), Etheridge (1964, xiphisternal ribs), Cuellar (1966, oviduct), Underwood (1970, scleral ossicles), and Cox and Tanner (1977, osteology and myology of the head and neck region). Texas populations were studied by Judd (1974, blood variation; 1975, thermal ecology; 1976a, food habits; 1976b, demography), Judd and Ross (1978, clutch size variation), Ross and Judd (1982, lipid cycles), and Selcer and Judd (1982, reproduction). Watson (1974) studied hormonal control of the seasonal color changes. Behavioral observations were published by Clarke (1965), Axtell (1956, burrowing), and Selander et al. (1962, mating). The relationships of *H. propinqua* were studied by Barbour (1921), Smith (1935), Clarke (1965), Guttman (1970), Cox and Tanner (1977), and Adest (1978). McKee and Martinez (1981) reported on nematodes in Texas *H. propinqua.*

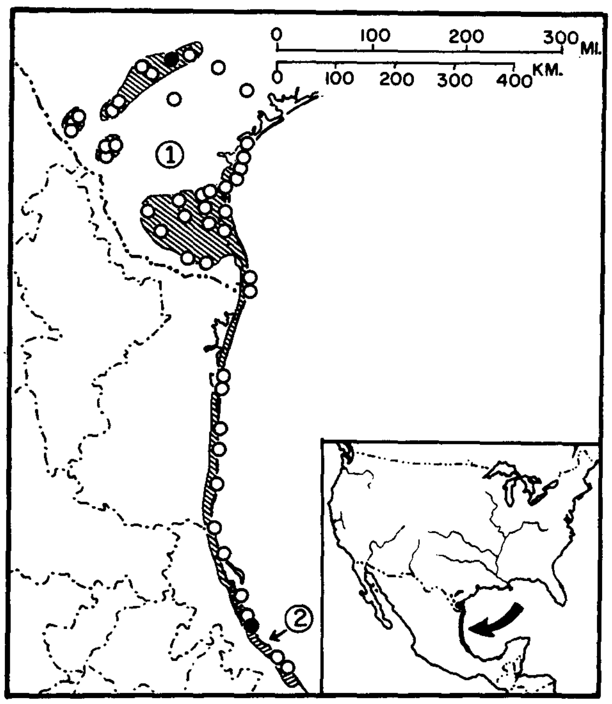
• NOMENCLATURAL HISTORY. The name *H. propinqua* was used for a western form of *H. maculata* by Cope (1867, 1900) and for *H. elegans* by Boulenger (1885) and others. Mocquard (1899) used it for a Baja California *Callisaurus.*

• ETYMOLOGY. *Propinquus* (Latin) means "near," implying nearness to *H. maculata. Piperata* (Latin) means "peppery," in allusion to the black dorsal speckling.

1. *Holbrookia propinqua propinqua* Baird and Girard

Holbrookia propinqua Baird and Girard, 1852:126. See species account.

Holbrookia propinqua stonei Harper, 1932:15. Type-locality, "north end of Padre Island, Texas." Holotype, adult male, Acad. Natur. Sci. Philadelphia 19879, collected on July 20, 1929 by B. P. Roberts (not examined by author).



MAP. Solid circles mark type-localities, hollow circles other localities.

·*Holbrookia propinqua propinqua:* Harper, 1932:16 (part). First use of trinomial.

• DEFINITION. Enlarged, keeled canthal scales three (on each side); anteriormost gular scales not subequal, and not arranged in a transverse row; fine black dorsal speckling reduced or absent; post-femoral stripe absent, or very pale and indistinct.

2. *Holbrookia propinqua piperata* Smith and Burger

Holbrookia propinqua piperata Smith and Burger, 1950:167. Type-locality, "on beach at Etiopa, two miles south of Tecolutla (20°28′55″N–96°59′W), Veracruz," Mexico. Holotype, adult (?) male, Univ. Illinois Mus. Natur. Hist. 4048, collected April 24, 1949, by R. W. Reese and P. W. Smith (holotype examined by author).

• DEFINITION. Enlarged, keeled canthal scales one or two (on each side); four subequal gulars transversely arranged following the anteriormost chinshields; dorsal pattern punctuated with many minute black specks; post-femoral stripe complete, or essentially complete, and dark.

LITERATURE CITED

Adest, G. A. 1978. The relations of the sand lizards *Uma, Callisaurus* and *Holbrookia*: An electrophoretic study. Ph.D. thesis, Univ. of California, Los Angeles. xiii + 118 p.
Axtell, Ralph W. 1956. A solution to the long neglected *Holbrookia lacerta* problem, and the description of two new subspecies of *Holbrookia.* Bull. Chicago Acad. Sci. 10(11):163–179.
— 1958. A monographic revision of the iguanid genus *Holbrookia.* Ph.D. thesis, Univ. of Texas, Austin. viii + 222 p.
— 1981. *Holbrookia propinqua*: Type specimens, collector, his route, and restriction of locality, with comments on Baird's "Reptiles of the Boundary" as an important taxonomic reference. J. Herpetol. 15(2):211–217.
—, and Aaron O. Wasserman. 1953. Interesting herpetological records from southern Texas and northern Mexico. Herpetologica 9(1):1–6.
Baird, Spencer F. and Charles Girard. 1852. Characteristics of some new reptiles in the museum of the Smithsonian Institution. Proc. Acad. Natur. Sci. Philadelphia 6:68–70, 125–129, 173.
Barbour, Thomas. 1921. A new lizard from Guaymas, Mexico. Proc. New England Zool. Club 7:79–80.
Behler, John L., and F. Wayne King. 1979. The Audubon Society field guide to North American reptiles and amphibians. Alfred A. Knopf, New York. 719 p.
Boulenger, G. A. 1885. Catalogue of lizards in the British Museum (Natural History). Second edition. London, Vol. 2. xiii + 497 p.
Clarke, Robert F. 1965. An ethological study of the iguanid lizard genera *Callisaurus, Cophosaurus,* and *Holbrookia.* Emporia State Res. Stud. 13(4):1–66.
Conant, Roger. 1975. A field guide to reptiles and amphibians of eastern and central North America. Second edition. Houghton Mifflin Co., Boston. xviii + 429 p.
Cope, Edward D. 1867. On the Reptilia and Batrachia of the Sonoran Province of the Nearctic Region. Proc. Acad. Natur. Sci. Philadelphia 18:300–314 (1866).
— 1875. Check-list of North American Batrachia and Reptilia; with a systematic list of the higher groups, and an essay on geographical distribution. Based on the specimens contained in the U.S. National Museum. Bull. U.S. Nat. Mus. (1):1–104.
— 1880. On the zoological position of Texas. Ibid. (17):3–51.
— 1900. The crocodilians, lizards, and snakes of North America. Ann. Rept. U.S. Nat. Mus. for 1898:153–1296.
Cox, D. C. and W. W. Tanner. 1977. Osteology and myology of the head and neck regions of *Callisaurus, Cophosaurus, Holbrookia,* and *Uma* (Reptilia: Iguanidae). Great Basin Natur. 37(1):35–36.
Cuellar, Orlando. 1966. Oviducal anatomy and sperm storage structures in lizards. J. Morphol. 119(1):7–20.
Earle, Alvin M. 1961. The middle ear of *Holbrookia* and *Callisaurus.* Copeia 1961(4):405–410.
Etheridge, Richard E. 1964. The skeletal morphology and systematic relationships of sceloporine lizards. Copeia 1964(4): 610–631.
Guttman, Sheldon I. 1970. An electrophoretic study of the hemoglobins of the sand lizards, *Callisaurus, Cophosaurus, Holbrookia* and *Uma.* Comp. Biochem. Physiol. 34(3):569–574.
Harper, Francis. 1932. A new Texas subspecies of the lizard genus *Holbrookia.* Proc. Biol. Soc. Washington 45:15–18.
Judd, F. W. 1974. Intraspecific variation in blood properties of the keeled earless lizard, *Holbrookia propinqua.* Herpetologica 30(1):99–102.
— 1975. Activity and thermal ecology of the keeled earless lizard, *Holbrookia propinqua.* Ibid. 31(2):137–150.
— 1976a. Food and feeding behavior of the keeled earless lizard, *Holbrookia propinqua.* Southwestern Natur. 21(1):17–26.
— 1976b. Demography of a barrier island population of the keeled earless lizard, *Holbrookia propinqua.* Occas. Pap. Mus. Texas Tech Univ. (44):1–45.
—, and R. K. Ross. 1978. Year-to-year variation in clutch size of island and mainland populations of *Holbrookia propinqua* (Reptilia, Lacertilia, Iguanidae). J. Herpetol. 12(2):203–207.
Karges, John P. 1979. Geographic distribution: *Holbrookia propinqua.* Herpetol. Rev. 10(4):120.
McKee, C. R., and S. Martinez, Jr. 1981. An endoparasite of *Holbrookia propinqua propinqua* (Iguanidae). Southwestern Natur. 26(1):75–76.
Mocquard, M. F. 1899. Contribution à la faune herpétologique de la Basse-Californie. Nouv. Arch. Mus. Hist. Natur. Paris (4)1:297–344.
Raun, G. G., and F. R. Gehlbach. 1972. Amphibians and reptiles in Texas. Dallas Mus. Natur. Hist. Bull. (2):ii+61.
Ross, R. K., and F. W. Judd. 1982. Comparison of lipid cycles of *Holbrookia propinqua* from Padre Island and mainland Texas. J. Herpetol. 16(1):53–60.
Schmidt, Karl P. 1922. A review of the North American genus of lizards *Holbrookia.* Bull. Amer. Mus. Natur. Hist. 46(12): 709–725.
Selander, Robert K., R. F. Johnston, B. J. Wilkes, and G. G. Raun. 1962. Vertebrates from the barrier islands of Tamaulipas, Mexico. Univ. Kansas Publ. Mus. Nat. Hist. 12(7):309–345.
Selcer, K. W., and F. W. Judd. 1982. Variation in the reproductive ecology of *Holbrookia propinqua* (Sauria: Iguanidae). Texas J. Sci. 34(2):125–135.
Smith, Hobart M. 1935. Notes on some Mexican lizards of the genus *Holbrookia,* with the description of a new species. Univ. Kansas Sci. Bull. 22(8):185–201.
— 1946. Handbook of lizards. Lizards of the United States and of Canada. Comstock Publ. Co., Ithaca, New York. xxi + 557 p.
—, and R. B. Smith. 1976. Synopsis of the herpetofauna of Mexico. Vol. III. Source analysis and index for Mexican reptiles. J. Johnson, N. Bennington, Vermont. 997 p.
Smith, P. W., and W. L. Burger. 1950. Herpetological results of the University of Illinois Field Expedition, spring 1949. III. Sauria. Trans. Kansas Acad. Sci. 53(2):165–175.
Underwood, G. 1970. The eye, p. 1–97. *In* C. Gans and T. S. Parsons (eds.), Biology of the Reptilia, Vol. 2. Morphology B. Academic Press, London and New York.
Watson, J. T. 1974. Endocrine control of breeding coloration and reproduction in the lizard *Holbrookia propinqua.* Ph.D. thesis, Univ. of Texas, Houston. 71 p.
Yatkola, Daniel A. 1976. Mid-Miocene lizards from western Nebraska. Copeia 1976(4):645–654.

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